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Development of new biomarkers and early prognosis of drug induced hepatotoxicity through NMR based metabolomic approaches

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Abstract

Hepatotoxicity (from hepatic toxicity) implies chemical-driven liver damage. Drug-induced liver injury is a cause of acute and chronic liver disease.The liver plays a central role in transforming and clearing chemicals and is susceptible to the toxicity from these agents. Certain medicinal agents, when taken in overdoses and sometimes even when introduced within therapeutic ranges, may injure the organ. Other chemical agents, such as those used in laboratories and industries, natural chemicals (e.g., microcystins) and herbal remedies can also induce hepatotoxicity. Chemicals that cause liver injury are called hepatotoxins . Drug-induced hepatotoxicity is a potentially fatal adverse effect and the leading cause of acute liver failure in most of the countries. The liver can be affected directly, in a dose-dependent manner, or idiosyncratically, independently of the dose, and therefore unpredictable. Currently, hepatotoxicity is a diagnosis of exclusion that physicians should suspect in patients with unexplained elevation of liver enzymes. Therefore, new diagnostic biomarkers are necessary to improve the prognosis of hepatotoxicity. Although several biomarkers have been found through various analytical and genetic approaches, none of them have been able to display enough specificity and sensitivity, so new approaches are needed. Targeted metabolomics aims to analyze a set of pre- selected metabolites from biologically relevant metabolic pathways. In this sense, metabolomics approaches using sophisticated instruments like NMR is a strongly and promising emerging field which is achieved from biofluids collected through minimally invasive procedures (either SPE or LLE or Ppt or ABE), can obtain early biomarkers of toxicity, which may constitute specific indicators of hepatotoxicity. These biomarkers can be mainly identified and qualified in rat but also for humans, several biomarkers will be described and will be validated, followed by future (pre-) clinical routine application. NMR based metabolomics , is able to acquire data from multiple types of biological samples such as bacteria, cultured mammalian cells, animal tissues and biofluids (e.g., serum and urine). Finally, the Bioinformatics softwares can automatically process the generated large-scale data set with high efficiency.

Biography:

Prof.(Dr.)Nalini Kanta Sahoo, working as Professor & H.O.D in one of the leading college (Marri Laxman Reddy Institute of Pharmacy) affiliated to JNTU,Hyderabad. He is at present with experience of 13+ years in (Academics, Administration and Accreditation, Training and Research) and taking care of all the Quality research strategies at the Institutions. He completed Ph.D from Siksha ‘O’Anusandhan University (NIRF rank-24 th).

Speaker Publications:

1. “a review on controlled porosity osmotic pump tablets and its evaluation” Academic research paper on "*Nano-technology*"

2.“ A Short Review on Cancer Biomarkers; ARC Journal of Clinical Case Reports; Page No : 6-9

3. Validation of Assay Indicating Method Development of Amoxicillin in Bulk and One of Its Marketed Dosage Form by RP-HPLC; Annals of Chromatography and Separation Techniques

4. A Study of Xerophthalmia and Associated Bio-social Factors in a Population of Tribal Residential School Children of Odisha; Indian Journal of Public Health Research & Development . Jan-Mar2017, Vol. 8 Issue 1, p18-23. 6p.

5. Etiological and histological profile of erythema nodosum in a tertiary care hospital at eastern India; International Journal of Applied Research; VOL. 2, ISSUE 5, PART P (2016)

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